
Enhancing the Effectiveness of Media Messages Promoting Regular Breast Self-Examination

Messages based on innovation adoption principles

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THAT MEDIA HEALTH MESSAGES can alter an audience's subsequent health behavior is widely accepted. Numerous studies in which groups receiving such messages have been compared with groups not receiving them have demonstrated that such messages can have an impact (1,2). The sociological characteristics of the people who are motivated by health promotion messages also have been described (3-10). This paper presents the results of examining the factors associated with message effectiveness in a sample of persons with these characteristics.

To reach the largest number of people at the lowest possible cost, public health educators and other persons engaged in public health education and promotion are turning more and more to the mass media to convey health messages. As the mass media are increasingly used, the format and presentation of the health message become important areas for investigation. For example, can different presentations of the same concept produce differential responses from the target audience? And

should the initial presentation of the concept differ from that used in its later promotion?

Women's actual practice of breast self-examination (BSE) illustrates how ineffective some health messages have been in producing long-term behavioral change. For example, surveys have shown that although nearly all women have at least heard of breast self-examination (90-99 percent), and most women have performed such an examination at least once (80-95 percent), very few have succeeded in adopting the procedure as a monthly routine (20-44 percent) (11-15); the proportions vary by the year of the sampling and the sampling frame. Apparently even though women are interested enough to try a preventive behavior, a health message may not succeed in convincing them to repeat it routinely.

Innovation Adoption Theories

Theories of innovation adoption—characteristics of person, place, or thing that influence behavior change—can help distinguish the women who will and will not adopt breast self-examination. How the target audience perceives the relative advantage, compatibility, and simplicity of BSE have been shown to be positively related to its adoption (15). Because the characteristics that women attribute to BSE are not necessarily the procedure's actual attributes, it may be possible to correct their perceptions of BSE by changing the message relating to it. Rogers and Shoemaker have described criteria for determining how people will perceive an innovation,

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and these may be of value in formulating the message that will be used to explain that innovation (16):

- Simplicity—the extent to which an innovation is perceived as easy to understand and use.
- Relative advantage—the degree to which the innovation is perceived as better than the idea that precedes it.
- Compatibility—the degree to which an innovation is similar to sociocultural values and beliefs, previously introduced ideas and practices, and the receiver's need for innovations in general.
- Trialability—the extent to which an innovation can be tried and rejected if not satisfactory. (An innovation has trialability if it does not result in a permanent situation. The trialability of BSE is a constant, since one can try BSE and readily discontinue the practice.)
- Observability—the extent to which the results of adoption of an innovation can be seen. (As Rogers and Shoemaker define the term observability, the advantages accruing from BSE will be observable only by the small proportion of women who become victims of breast cancer.)

Messages that meet Rogers and Shoemaker's criteria of simplicity, relative advantage, and compatibility have been found to be positively related to the adoption of breast self-examination (14). Although BSE is promoted as a practice that is easy to perform, and ease of performance is an attribute that facilitates the adoption of an innovation, many women perceive certain components of the examination as difficult (11–15). Problems

that have been reported include not understanding exactly how the examination should be done, not remembering how the breasts felt during the previous examination, and not knowing what abnormal breast tissue feels like.

If messages promoting BSE adhered to the principles on which innovation adoption theory is based, a higher rate of BSE adoption could be expected. More specifically, if the relative advantage of BSE was stressed and the promotional message made the procedure seem simpler, more observable, and more compatible, a greater number of women could be expected to adopt the practice.

Roger and Shoemaker's definition of observability has been expanded in the current study to include not only the observability of results, but also the observability or overtness of the examination technique itself. The ability to perform BSE correctly depends a great deal upon an understanding of the technique as described in the health message, and that understanding depends upon how clearly or overtly the components of the examination procedure are conveyed.

Differences in the health messages themselves, however, were not expected to explain completely the variance between the adopters and nonadopters of BSE, and therefore the relevant characteristics of the adopters of BSE were also investigated (3,6,8,15). I have provided elsewhere a profile of the women who practice BSE (15). These women, as compared with the non-

adopters, have a stronger orientation toward preventive health behavior, a higher socioeconomic status, less inhibition about their breasts, a more positive attitude about BSE, and a more developed social network supporting BSE. They also are younger, more highly educated, and know more about BSE.

Composing an Experimental Message

It has been demonstrated that women are somewhat confused about how to perform BSE and that most women find it difficult to make it a routine practice (11,13,15). To overcome these difficulties, I prepared an experimental pamphlet based on the innovation adoption principles of simplicity and compatibility.

Since the American Cancer Society (ACS) probably disseminates the largest number of messages aimed at cancer control in the country, its method of describing BSE seemed to be the one that women would most readily recognize. Therefore the ACS pamphlet "How to Examine Your Breasts" was selected for comparison with the experimental pamphlet.

To achieve simplicity, the BSE practice is described in the experimental message in four concise sentences:

- Massage all parts of both breasts and armpits using the pads of your fingertips.
- Do the exam as part of your bathing or bedtime routine.
- Because breasts are similar in construction, compare what you see (using a mirror) and feel in one breast with the other.
- If you notice a difference, see your doctor.

In the American Cancer Society message, 433 words are used to describe the BSE procedure, compared with 54 words in the experimental message.

The observability or overtness of the examination is increased by using more demonstrative words to describe the procedure than are used in the ACS pamphlet. For example, in the ACS message, the woman is advised to "press firmly in small circular motions. . . ." In the experimental message, the word "massage" replaces this phrase.

Women have expressed some confusion and lack of confidence about their ability to differentiate normal breast structures from abnormal. The ACS message informs women that through regular inspections they will learn what is normal for them. In the experimental message, on the other hand, women are instructed to compare each of their breasts with the other one during each examination to detect changes or differences. Even though a woman's breasts are not constructed exactly the same, they are nearly symmetrical. By comparing each breast with the other during each examination, a

woman not only becomes familiar with her breasts more quickly, but also has less trouble remembering what they feel like from one examination to the next. The experimental message seeks to make the BSE procedure more overt by providing more demonstrative instructions to help overcome some of the confusion surrounding the actual practice of breast self-examination.

Compatibility was addressed by trying to make it easier to institute a regular BSE. Monthly checks are recommended in the ACS pamphlet, with the menstrual period as a guide. Since, however, most repetitive preventive health practices occur on a daily, or at least a weekly basis, in the experimental message women are urged to associate BSE with one of their more frequently occurring habits (brushing their teeth, washing their hair, and the like). The association with such habits makes BSE more compatible with a woman's current behavior and therefore facilitates its adoption as a regular routine.

Methods Used to Compare Messages

The effectiveness of the BSE instruction provided in the ACS message and in the experimental message was tested on two study samples drawn from comparable geographic areas. Two villages from western New York were chosen for the test because they were similar in population size, racial composition, education, income, and the age distribution of their female residents. The village of Hamburg provided the experimental panel and the village of East Aurora, the comparison panel. The variables that the villages shared are known to be differentially associated with the incidence of breast cancer. Since differences in the relative risk of the disease might affect the rate of BSE adoption, it was desirable to control for them.

Publication by the R. L. Polk Company of yearly censuses for both areas maximized the possibility of reaching the current female residents of the two villages. The study samples (including control groups) were limited to women 21-65 years, whose names were drawn randomly from the alphabetical street listings in the Polk directories.

Pretest telephone interviews were conducted with members of both panels. The experimental panel then was sent the experimental pamphlet five times, and the comparison panel received five of the ACS pamphlets over a 2-month period. Two control groups, one in each area, received no pamphlets. After the mailings, women in the comparison and experimental panels were reinterviewed by telephone, and the reinterview data were compared with the pretest data. The two control groups were interviewed only at the time of the post-test. The study required 3½ months to complete.

The pretest defined a baseline of the women's knowledge of, attitudes toward, and practice of breast self-examination (the dependent variables in the study). Data were also obtained on the women's relevant medical history, their perception of the relative advantage of the examination, their other preventive health behaviors, the extent to which a network of social influence and support for BSE from friends, husband, family, or physician had developed, the degree to which taboos or inhibitions surrounded concerns about their breasts, their personal beliefs about their own breast cancer risk, and sociodemographic information. Control questions were included in the posttest interview to assess any other events that might have affected the frequency or regularity of breast examination.

The women in the control groups were asked the same questions as the experimental and comparison panels, and they were also asked several additional questions to control for maturation effects (that is, for the effects of events or factors other than the study mailings that might explain changes reported at the posttest interview). These women were asked, for example, whether they had been exposed during the study period to any BSE instruction in the media or from medical personnel.

Measures of quality control were instituted to ensure the accuracy and reliability of the interview data. These measures included precoded questions, blind interviewing, recalling 10 percent of the participants for

reinterview by the interview supervisor, and rechecking the coded data for accuracy.

Characteristics of the Study Samples

At the pretest, the distributions of all sociodemographic variables and of the measurements of BSE knowledge, attitudes, and practice were statistically comparable for both panels (based on a chi square test at the 95 percent confidence level). Table 1 shows the characteristics of the study samples that were considered important in assessing the effects of the experimental message.

Additive scales were constructed to measure knowledge, attitudes, and practice. At the pretest, the mean scores for the experimental and comparison panels were similar; the pretest scores for each panel were also similar to those for its respective control group:

| Group | BSE knowledge | BSE attitudes | BSE practice |
|--------------------------------|---------------|---------------|--------------|
| Experimental panel: | | | |
| Mean score | 5.0 | 6.0 | 1.5 |
| Standard error | (±0.08) | (±0.18) | (±0.06) |
| Experimental posttest control: | | | |
| Mean score | 4.7 | 6.3 | 1.5 |
| Standard error | (±0.08) | (±0.02) | (±0.07) |
| Comparison panel: | | | |
| Mean score | 4.9 | 5.9 | 1.5 |
| Standard error | (±0.08) | (±0.17) | (±0.07) |
| Comparison posttest control: | | | |
| Mean score | 4.9 | 5.8 | 1.3 |
| Standard error | (±0.08) | (±0.02) | (±0.07) |

Table 1. Comparison of sociodemographic variables in the experimental and comparison panels

| Sociodemographic variables ¹ | Experimental panel | | Experimental control group | | Comparison panel | | Comparison control group | |
|-----------------------------------------|--------------------|---------|----------------------------|---------|------------------|---------|--------------------------|---------|
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Age in years—totals | 381 | 100 | 115 | 100 | 327 | 100 | 109 | 100 |
| 21-35 | 124 | 34 | 30 | 26 | 106 | 34 | 32 | 32 |
| 36-45 | 95 | 26 | 28 | 25 | 84 | 27 | 19 | 19 |
| 46-55 | 77 | 21 | 31 | 27 | 70 | 23 | 23 | 22 |
| 56-65 | 70 | 19 | 25 | 22 | 50 | 16 | 27 | 27 |
| No answer ² | 15 | ... | 1 | ... | 17 | ... | 8 | ... |
| Years of education—totals . . . | 381 | 100 | 115 | 100 | 327 | 100 | 109 | 100 |
| Less than 12 | 28 | 8 | 9 | 8 | 19 | 6 | 13 | 13 |
| 12 | 122 | 33 | 44 | 39 | 103 | 33 | 35 | 34 |
| 13-15 | 108 | 30 | 33 | 29 | 104 | 33 | 28 | 27 |
| 16 or more | 107 | 29 | 27 | 24 | 89 | 28 | 26 | 26 |
| No answer ² | 16 | ... | 2 | ... | 12 | ... | 7 | ... |
| Marital status—totals | 381 | 100 | 115 | 100 | 327 | 100 | 109 | 100 |
| Married | 317 | 87 | 99 | 87 | 271 | 86 | 92 | 89 |
| Never married | 9 | 2 | 2 | 2 | 7 | 2 | 4 | 4 |
| Other | 41 | 11 | 13 | 11 | 39 | 12 | 7 | 7 |
| No answer ² | 14 | ... | 1 | ... | 10 | ... | 6 | ... |

¹ All women in the study samples were white.

² No-answer categories were not used in calculating the percentages.

Response Rates and Demographic Variables

In computing response rates for the samples, all subjects under 65 years old who had moved, died, or had their telephones disconnected were excluded. Attempts to contact subjects for both the pretest and posttest interviews were made over a 2-week period. Table 2 shows the response rates for each phase of the investigation. Changes were analyzed only for women who participated in both the pretest and the posttest (that is, only for members of the experimental and comparison panels).

The dropout rates for the comparison panel and the experimental panel were similar. Those panel members completing the posttest interview, those refusing it, and those who could not be reached were compared. The women who refused the interview were less likely to practice BSE than those who completed it. They were older (over 50) and had more negative attitudes about BSE. They also knew less about the specifics of breast self-examination and received less encouragement and social support for its practice.

The women who could not be reached for a posttest interview differed from the women completing the posttest only in being less likely to be married and less likely to have a family history of breast cancer. They also expressed less interest in BSE and were less likely to practice it. The repeated requests of some of these women that they be recalled for an interview at a more convenient time suggest that they might have been less willing to give the time to be reinterviewed than the women who completed the posttest. The differences in characteristics among the groups completing

the interview, refusing the interview, and who could not be reached are addressed more fully in my dissertation (15).

Maturation Effects

Posttest control groups were selected to determine whether maturation effects (external factors other than the study mailings) could have accounted for any of the reported changes in BSE behavior between the two interviews. The scores for BSE knowledge, attitudes, and practice for each of these control groups were comparable to those for the experimental and comparison panels in their pretest interviews. Thus, based on the control group data, one can almost unequivocally state that no other factor except the study mailings could have explained any of the changes in the experimental or comparison panel with respect to breast self-examination.

As noted, the scores in the posttest for each control group were also similar to those for its corresponding panel. In some cases, the control group's score was even lower than its respective panel's pretest score. Random sample selection had been used to prevent such differences from occurring, but apparently by chance a bias in the samples emerged.

Results of Comparison of Messages

I first analyzed the effectiveness of each BSE message by multivariate linear regression. Then, with pretest scores controlled, the posttest scores for BSE knowledge, attitudes, and practice were assessed according to which message the women had received and how many of the messages they had read. As might be expected, the pretest scores on each of the dependent variables accounted for most of the variance in the posttest scores. The particular message that was received and the number of messages that were read did not appear to have a significant linear relationship with BSE knowledge, practice, or attitudes.

Using other statistical methods, I then tested for any nonlinear associations of the changes that had occurred within each panel and also compared changes between the experimental and comparison panels. The results of analysis of the changes between the pretest and posttest means for the dependent variables are reported in table 3. I found no evidence to support the occurrence of an attitude change within either panel. The comparison panel experienced a significant ($t = 2.26$) change in the mean score for the knowledge index. Comparison of the pretest and the posttest means for breast self-examination practice showed that the experimental panel had experienced a significant change: the mean frequency for the practice of breast

Table 2. Responses of the experimental and comparison panels in the pretest, posttest, and posttest-control interviews about breast self-examination

| Kind of Interview and of response | Experimental panel | | Comparison panel | |
|----------------------------------------------------|--------------------|---------|------------------|---------|
| | Number | Percent | Number | Percent |
| Pretest interviews | 621 | 100 | 561 | 100 |
| Completed | 381 | 61 | 327 | 60 |
| Refused | 104 | 17 | 119 | 20 |
| Subjects not reached . . . | 136 | 22 | 115 | 20 |
| Posttest interviews | 381 | 100 | 327 | 100 |
| Completed | 176 | 49 | 163 | 52 |
| Refused | 90 | 25 | 60 | 19 |
| Subjects not reached . . . | 94 | 26 | 91 | 29 |
| Subjects moved—discon- nected telephone | 13 | ... | 7 | ... |
| Mailing dropouts | 8 | ... | 6 | ... |
| Posttest-control interviews . | 179 | 100 | 159 | 100 |
| Completed | 115 | 64 | 109 | 69 |
| Refused | 27 | 15 | 29 | 18 |
| Subjects not reached . . . | 37 | 21 | 21 | 13 |

Table 3. Effect of the 5 mailings on the mean scores for the behavioral change variables in the experimental and comparison panels

| Variables with scales for scores | Experimental panel | | Comparison panel | |
|-----------------------------------------|--------------------|----------|------------------|----------|
| | Pretest | Posttest | Pretest | Posttest |
| Frequency of BSE (0 to 3): ¹ | | | | |
| Mean score | 1.5 | *2.0 | 1.6 | 1.7 |
| Standard error | ±0.07 | ±0.08 | ±0.07 | ±0.08 |
| Attitude scale (0 to 9): ² | | | | |
| Mean score | 6.0 | 5.9 | 5.9 | 5.8 |
| Standard error | ±0.2 | ±0.2 | ±0.2 | ±0.2 |
| Knowledge index (0 to 7): ³ | | | | |
| Mean score | 4.9 | 4.9 | 4.9 | *5.1 |
| Standard error | ±0.08 | ±0.09 | ±0.08 | ±0.11 |

¹ 0—Never practice BSE, 1—less than once a month, 2—monthly, 3—more than once a month.

² Total positive responses to the 9 questions on attitude.

³ Total correct responses to questions about BSE knowledge.

* $P < 0.05$.

self-examination attained the desired level of at least monthly.

At the pretest, 10 members (9 percent) of the experimental panel reported they had never done a breast examination. At the posttest, only one woman still reported no attempt to do the examination. The nonparametric statistic, McNemar's test for the significance of change, shows that this change was significant ($P < 0.02$, $t = 5.82$). Five members of the posttest control group (4 percent) had never done a breast examination.

Next, by contingency table analysis, I tested whether the changes in BSE knowledge, attitudes, and practice could significantly differentiate one panel from the other. Since the two panels' attitude scores had not been affected by the experiment and had been similar at the pretest, these scores were also comparable at the posttest. The distribution of the posttest knowledge scores of the experimental panel and the comparison panel did not differ significantly at the 95 percent confidence level. Thus, even though the mean knowledge score for the comparison panel had increased following the mailings, this increase was not large enough to differentiate the distribution of its scores from that of the posttest experimental panel. Therefore, even though the mean score of the comparison panel reflects some improvement in its members' BSE knowledge, the distribution of its scores did not differ significantly from the distribution of the scores of the other panel.

A significant difference, however, was observed in the reported frequency of the practice of breast self-examination by the experimental and comparison panels (table 4). After the intervention (the mailings), more of the women in the experimental panel were perform-

ing their BSE at least monthly than the women in the comparison panel. Also, significantly more of the women in the experimental panel were performing BSE more often than once a month.

BSE Adopters in the Experimental Panel

Since significant behavioral changes in respect to BSE occurred only in the experimental panel, the rest of my analysis focused on the social-psychological correlates that differentiated the post-intervention adopters from the nonadopters in that one panel. Women were classified as adopters if they reported a higher frequency of breast self-examination at the posttest than at the pretest. Subjects already performing a regular monthly examination at the time of the pretest were not included in either the adopter or nonadopter group.

The mean scores for all correlates were compared, and tests of the differences in the means were completed on all items. These variables and the corresponding t scores for the 75 adopters of BSE and the 42 nonadopters were as follows:

| Variable | t score |
|----------------------------------------|--------------------|
| Health control | .921 |
| Perceived risk | .710 |
| Age | .327 |
| Number of messages read | .254 |
| Hard to remember to do examination | ¹ 2.479 |
| Hard to remember what breast felt like | ¹ 3.260 |
| Socioeconomic status | .179 |
| Social support | ¹ 2.742 |
| Lack of inhibition about breasts | 1.765 |
| Medical preventive health behavior | .478 |
| Autonomous preventive health behavior | .253 |
| Exercise | .692 |
| Attitude toward BSE | .904 |
| Knowledge of BSE | 1.498 |

¹ Significant at < 0.05 .

The means for only three variables differed significantly between the adopters and nonadopters of BSE. The BSE adopters had higher mean scores on the social

Table 4. Comparison of the postintervention frequency of breast self-examination in the experimental and comparison panels

| Frequency of breast self-examination | Percent of experimental panel (N=171) | Percent of comparison panel (N=159) | Both panels (N=330) | |
|--------------------------------------|---------------------------------------|-------------------------------------|---------------------|---------|
| | | | Number | Percent |
| Never | 13 | 15 | 45 | 14 |
| Less than once a month | 16 | 26 | 70 | 21 |
| Monthly | 33 | 34 | 110 | 33 |
| More than once a month | 38 | 25 | 105 | 32 |

NOTE: $\chi^2 = 8.39$, $df = 3$, $P < 0.04$.

support scale, an indication that they received more encouragement and support from their husbands, families, and physicians to do their breast examinations than did the nonadopters. The other two variables with significantly higher means were those related to complexity. If at the time of the pretest a woman perceived the BSE as difficult to remember to do, she was more likely to increase the frequency of its performance following receipt of the experimental messages. Likewise, if a woman found it difficult to remember what her breasts felt like from one month to the next, she was also more likely to have increased the frequency of her examination by the time of the posttest. The experimental message suggested that the examination be done in association with a bathing or bedtime routine. Whether or not this suggestion was carried out differentiated the examination adopters from the nonadopters.

Discussion

Multivariate regression analysis did not support the hypothesis that there is a linear relationship between the kind of message presentation and behavioral change. Possibly the pretest scores for BSE behavior simply accounted for so much of the variance that the other variables showed up as nonsignificant. However, several nonlinear relationships were noted.

The experimental panel's posttest mean score showed a significant increase in BSE frequency as compared with its pretest score, and this change produced a significantly different distribution of scores for frequency of performance than the distribution for the comparison panel. The suggestion in the experimental message that the breast examination be done along with a bathing or bedtime routine apparently appealed to the BSE adopters. It may have simplified the examination enough for these women to establish it as a routine, or the increased frequency of performance may have made it a more compatible procedure. Perhaps both factors were involved.

The posttest mean knowledge score of the comparison panel increased over its pretest score, but this change did not reflect a significantly different distribution of scores from that of the experimental panel.

The lack of change in the attitude toward BSE has several plausible explanations. First, studies of attitude change that are completed in a natural setting often fail to show any change, perhaps because a self-selection process is involved in participants exposing themselves to the message (17,18). Since my main interest was in the message intervention as an entity, I did not focus the posttest measurements on specific aspects of the message, nor analyze the extent to which the message was understood correctly. Second, a ceiling effect on

BSE attitude changes may have been a factor in the lack of any change. Because the women in the study had an overwhelmingly positive attitude toward BSE before the experiment, there may have been little room for improvement.

Several problems arose during the study that can be linked to the research design itself. One was that completion rates both for the pretest and posttest interviews were low. This result was not entirely attributable to high refusal rates; it was also due partly to substantial difficulty in reaching the sample members within the 2-week period that was imposed to limit a diminishing returns effect following the experiment. Even the completion rates for the most persistent interviewers were only about 10 percent higher than those for the other interviewers.

A second problem associated with the research design was that the rate of attrition of participants was high. The sample members who could not be reached for a second interview or who refused a second interview differed significantly from those who continued to participate in the study, and these differences may have been partially responsible for the outcomes in the two panels. As mentioned, sample attrition removed from the panels the group most resistant to adopting breast self-examination. This group also was probably the one in which it would have been most difficult to effect behavioral change as regards to BSE. Moreover, the degree of cooperation required of participants by the research design may have resulted in the selection of a unique group of women who, being more compliant or persuadable than the sample as a whole, contributed to the experimental messages' success. Even though the sample attrition rate was high, it was similar for both panels. Also, since the analysis was completed only for the subjects who were interviewed at both the pretest and the posttest, the differential impacts of the mailings are noteworthy.

A third problem may have been an artifact of the statistical analysis of means. Since, to increase compatibility, more frequent examinations were advocated in the experimental message than in the comparison message, different ceiling effects (in terms of the desirable frequency) might have affected the mean score for BSE practice. The same is true for the BSE knowledge scores: for the sake of simplicity, only the basics of the BSE procedure were included in the experimental message. Thus, the experimental subjects had less information with which to increase their knowledge than did the comparison subjects.

McNemar's test for the significance of change was also affected by the research design. Because most of the women who at the pretest had never done a breast

examination did not participate in the posttest (and thus were eliminated from this test statistic), this result must be received cautiously.

The changes within these samples of white, well-educated women cannot be attributed solely to the specific message they received. It appears that there may have been a more complex interaction of the message with other independent variables, an interaction similar to one described by Kegeles (19). This author, having noted more behavioral change in an experimental group than in a control group following the receipt by each of separate messages, suggested that the experimental communication that he tested was a better cue for behavioral change than the control communication. Similarly, the experimental message in the current study may have been a better cue than the ACS message for certain women to adopt a monthly practice of BSE (namely, those with social support for BSE, those with a perception of the complexity of habituating themselves to its regular practice, and those already practicing it, but irregularly). Obviously, some messages will be more effective than others in cueing particular behaviors. Also, some messages may be more successful than others at a particular stage in the innovation adoption cycle. The more appropriate the message for the target audience, the greater will be its success in persuading members of that audience to change their behavior.

It is interesting that the variability among the independent variables was great even though the characteristics of the panel members were relatively homogeneous. If a more heterogeneous population had been involved, the associations under investigation might have been obscured. Thus, it may be prudent to control for the known demographic characteristics of innovation adopters, as was done in the current study, when examining the less well-understood social-psychological correlates of the women who adopt BSE.

In most efforts at cancer control, media messages have been more successful in effecting behavior change among audiences similar to the one described here than in the general population. However, the results presented may be more widely applicable than they first appear to be. If in media campaigns to control cancer (and perhaps in other health promotion programs), the messages were designed as concisely, clearly, and demonstratively as possible, their effectiveness in stimulating behavioral change might be vastly increased.

Crosson and associates reported on a quasi-experimental design that focused on the success of a specific BSE education program (1). They found that their experimental group knew more about BSE and was also more likely to practice monthly examinations than their

control group, which had had no BSE education program. The frequency of BSE practice was greater in groups receiving a message promoting it than in groups receiving no message at all. However, when a message is based on innovation adoption principles, it can be quantitatively even more effective.

Conclusions

The curve for innovation adoption has been defined; as have the characteristics of the people who can be designated as innovators, early and late adopters, and laggards (20). It is logical to assume that motivating messages should differ at different points along the innovation adoption curve because target audiences differ. The American Cancer Society's message about breast self-examination probably succeeded in motivating the innovators and some early adopters to practice monthly BSE. Since, however, the proportion of message recipients practicing BSE monthly has not continued to increase (11,12), this message may not be effective in inducing later adopters to practice BSE monthly.

A new message that would be more persuasive seemed to be needed. The new message tested in the current study did prove more successful than the standard ACS message in promoting a specific health behavior—monthly BSE, especially among women who had supportive social networks. The influence of such social support is frequently cited as being a positive predictor of changes in health behavior.

Programs directed at smoking cessation (21), weight loss (22), and reducing the risk factors for cardiovascular disease (2)—to name but a few—have demonstrated how effective a support group can be in modifying a negative health behavior. In the current report, a support group was shown to be strongly related to the adoption of positive health behavior. This result, if appropriately applied in health promotion campaigns, can increase their persuasive force and enable them to effect greater behavioral change than they are now achieving.

In cancer control programs, as in many other disease control efforts, primary and secondary prevention are receiving as much emphasis as treatment. All prevention programs must be based on an understanding of the motivation required for a healthy person to perform the particular preventive health behavior. Without such knowledge, the success that the program attains will be limited, costly, and slow in coming—if it comes at all. Sociological theories can contribute to an understanding of how normative changes in health behavior take place and how people can be most effectively persuaded to make such changes.

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SYNOPSIS

HOWE, HOLLY L. (New York State Department of Health): *Enhancing the effectiveness of media messages promoting regular breast self-examination. Messages based on innovation adoption principles. Public Health Reports*, Vol. 96, March-April 1981, pp. 134-142.

As public health departments have come to rely more and more on the mass media for the promotion of healthful behavior, it has become increasingly desirable to determine the motivating capability of the messages used in this promotion. A fact that is well understood is that many times any message at all is better than none. However, the effectiveness of various media health mes-

sages has not been well researched.

A study was therefore undertaken of the comparative effectiveness of two different messages describing how to do a breast self-examination. An "experimental message" for the study was designed by applying the principles that facilitate innovation adoption to the message's format and presentation. This message's impact was then compared with that of the American Cancer Society's pamphlet "How To Examine Your Breasts." This pamphlet had been mailed to a sample of women similar to those receiving the experimental message, but who lived in a different geographic area. The use in each area of control groups who had re-

ceived no messages afforded an opportunity to study maturation effects (other factors than the mailings that might have influenced study results).

The experimental message proved more successful in persuading women to adopt breast self-examination than the comparison message. The women who reported a change in breast self-examination practice following the mailing could be characterized as having a more extensive social support system to promote breast examinations and as having a pre-experiment perception that breast self-examination was a complex practice to perform repeatedly at regular intervals.